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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,548	10/24/2003	Lianjun Liu	SC11645ZP P01	1109
23125	7590	09/20/2005	EXAMINER	
FREESCALE SEMICONDUCTOR, INC. LAW DEPARTMENT 7700 WEST PARMER LANE MD:TX32/PL02 AUSTIN, TX 78729			ROJAS, BERNARD	
			ART UNIT	PAPER NUMBER
			2832	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,548

Applicant(s)

LIU ET AL.

Examiner

Bernard Rojas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10242003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I claims 1-13 and 17-22 in the reply filed on 06/30/2005 is acknowledged. The traversal is on the ground(s) that the term "forming" is broad enough to encompass all the methods on making the device. This is found to be persuasive.

Claims 14-16 are hereby rejoined and fully examined for patentability under 37 CFR 1.104.

Since all claims previously withdrawn from consideration under 37 CFR 1.142 have been rejoined, the restriction requirement made in the Office action mailed on 06/14/2005 is hereby withdrawn.

Specification

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;

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- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6, 7, 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al. [US 6,768,403] in view of Lin et al. [US 6,818,936].

Claims 1, 3 and 4, Hsu et al. discloses a method of making a device comprising the steps of: providing a substrate [14]; forming a first conductive layer [18, 20, 22 and 34] over the substrate [figure 4A]; forming a sacrificial layer [46] over the first conductive

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layer [figure 4B]; forming a dielectric layer [26] over the sacrificial layer, forming a second conductive layer [30] over the sacrificial [figure 4E]; and removing the sacrificial layer [figure 4F].

Hsu et al. fails to disclose that the dielectric layer comprises silicon, oxygen, and nitrogen and is formed by PECVD.

Lin et al. teaches that a common dielectric material in the art is silicon oxynitride that is formed by plasma enhanced chemical vapor deposition (PECVD) [col. 6 lines 1-34].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide disclosed by Hsu et al. since it was known in the art as a dielectric material [Lin et al. col. 6 lines 1-34].

Claim 2, Hsu et al. discloses the method of claim 1, wherein the forming the sacrificial layer comprises forming a polyimide layer [col. 7 lines 40-45, 59-63].

Claims 9-11, Hsu et al. discloses a method of making a microelectronic device comprising the steps of: providing a substrate [14]; forming an input signal line [18] over the substrate; forming an output signal line [20] over the substrate and spaced apart from the input signal line [figure 4A]; forming a sacrificial layer [46] over the input signal line and the output signal line [figure 4B]; forming a dielectric layer [26] over the sacrificial layer [figure 4C]; removing the sacrificial layer [figure 4F]; and forming a conductive layer [30] over the dielectric layer.

Hsu et al. fails to disclose that the dielectric layer comprises silicon, oxygen, and nitrogen and is formed by PECVD.

Lin et al. teaches that a common dielectric material in the art is silicon oxynitride that is formed by plasma enhanced chemical vapor deposition (PECVD) [col. 6 lines 1-34].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide disclosed by Hsu et al. since it was known in the art as a dielectric material [Lin et al. col. 6 lines 1-34].

Claims 14 and 15, Hsu et al. discloses a microelectronic device comprising a substrate [14], a first conductive layer [18, 20, 22 and 34] over the substrate [figure 4A]; a dielectric layer [26] over the first conductive layer [figure 4C]; a gap [44] between the first conductive layer and the dielectric layer; and a second conductive layer [30] over the dielectric layer.

Hsu et al. fails to disclose that the dielectric layer comprises silicon, oxygen, and nitrogen.

Lin et al. teaches that a common dielectric material in the art is silicon oxynitride [col. 6 lines 1-34].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide disclosed by Hsu et al. since it was known in the art as a dielectric material [Lin et al. col. 6 lines 1-34].

Claim 16, Hsu et al. discloses that the dielectric layer is part of a cantilever structure [figure 4F].

Claims 17 and 18, Hsu et al. discloses a method of making a device comprising the steps of: providing a substrate [14]; forming a first conductive layer [18, 20, 22 and 34] over the substrate [figure 4A]; forming a sacrificial layer [46] over the first conductive layer [figure 4B]; forming a dielectric layer [26] over the sacrificial layer [figure 4C]; forming a second conductive layer [30] over the sacrificial layer [figure 4E]; and removing the sacrificial layer [figure 4F].

Hsu et al. fails to discloses that the dielectric layer comprises silicon, oxygen, and nitrogen and is formed by PECVD.

Lin et al. teaches that a common dielectric material in the art is silicon oxynitride that is formed by plasma enhanced chemical vapor deposition (PECVD) [col. 6 lines 1-34].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide discloses by Hsu et al. since it was known in the art as a dielectric material [Lin et al. col. 6 lines 1-34]..

Claims 6, 12 and 19, Lin et al. discloses the claimed invention except for the temperature range at which PECVD is performed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform PECVD at a temperature between approximately 200 and 300 degrees Celsius, since it has been held that where the general conditions of a claim are disclosed in the prior art,

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discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claims 7, 13 and 20, Lin et al. discloses the claimed invention except for the temperature at which PECVD is performed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform PECVD at a temperature of approximately 240 degrees Celsius, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu et al. [US 6,768,403] in view of Murakami et al.

Claims 5 and 8, Hsu et al. discloses the claimed method of making a device with the exception that the dielectric layer comprises silicon, oxygen, nitrogen and hydrogen that are formed by PECVD.

Murakami et al. teaches forming a silicon oxynitride dielectric film comprising N₂O; N₂; NH₃; and SiH₄ by plasma CVD [paragraph 87].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a silicon oxynitride dielectric material instead of the silicon nitride or silicon oxide discloses by Hsu et al. since it was known in the art as a dielectric material [as taught by Lin et al. col. 6 lines 1-34].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Bernard Rojas
BR

[Signature]
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